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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,674	10/15/2003	Shinji Kaneko	17105	7046

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EXAMINER	
JUBA JR, JOHN	

ART UNIT	PAPER NUMBER
2872	

DATE MAILED: 03/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/685,674	KANEKO, SHINJI	
	Examiner	Art Unit	
	John Juba, Jr.	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 February 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) *11* is/are withdrawn from consideration.

5)☒ Claim(s) *1 and 6* is/are allowed.

6)☒ Claim(s) *2-5 and 7-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/15/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Group I, claims 1 - 10 in the reply filed on February 18, 2005 is acknowledged. Claim 11 is withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Claim Objections

Claims 2 – 5 are objected to because of the following informalities: In claim 2 (lines 6 – 7), "than a rigidity of __ remaining region" lacks an article. Appropriate correction is required. Claims 3 – 5 inherit the same informality through their dependency from claim 2.

Claim Rejections - 35 USC § 112

Claims 4, 5, and 7 – 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 4 and 5 are confusing or incorrect in the recitation of a displacement gradient that varies in a direction vertical to the reflective surface. Rather, it is believed that what is meant is that there is a gradient is the displacement along a direction vertical to the reflective surface that varies from location to location. Claim 4 is further confusing as to what is meant by the recited ratios of a portion [with respect] to a

location. Does the claim mean to recite, for example, a ratio of the surface area of portion with the lower rigidity to the surface area of the portion having a large displacement gradient? Similarly, claim 5 is further confusing in reciting a ration of openings to locations. Does the claim mean to recite a ratio of the number of openings to an area?

Claim 7 is ambiguous and indefinite in reciting "a ratio of the openings" without reciting a point of reference. That is, the claim begs the question "the ratio of the openings with respect to what?" It is not clear whether the claim is referring to the number of openings and a ratio of the number of openings per unit area, or to a ratio of the size of the openings to some other variable. Claim 8 inherits the ambiguity through its dependency from claim 7.

Claim 9 is ambiguous and confusing in reciting that the lower electrode has a plurality of openings arranged at different intervals, since the structure is recited as comprising a plurality of lower electrodes. It is not clear whether the claim intends to recite that, from among the plurality of lower electrodes, [at least] one lower electrode has a plurality of openings arranged at different intervals, or whether the claim means to recite that the plurality of lower electrodes are arranged with a plurality of openings *therebetween,* the openings being arranged at different intervals. Claim 10 inherits the same ambiguity through its dependency from claim 9.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 2 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by Blomberg, et al (U.S. Patent number 5,561,523). Referring *for example* to Figure 3 and the associated text, Blomberg, et al disclose a mirror (41) comprising a flexible film having a plurality of electrodes (20)(22) and a reflective surface (the lower surface of mirror 41 at its interface with air in the etalon 8) whose shape varies when an electrostatic force is applied to the plurality of electrodes (via counter electrode 6), the flexible film having a peripheral region defined by thinned portion (15) having lower rigidity than the remaining portion. Although the center-most portion (24) of mirror (41) remains flat during electrostatic deflection, it is clear that the remainder of the lower mirror surface changes shape.

With regard to claim 3, a peripheral region of the upper mirror is also provided with holes (28).

Allowable Subject Matter

Claims 1 and 6 are allowable over the prior art. Claims 7 - 10 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action. Claims 4 and 5 would be allowable if rewritten

to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art, taken alone or in combination, fails to teach or fairly suggest

a variable-shape mirror wherein it is the flexible film that has the plurality of electrodes, the electrodes are subject to an applied electrostatic force, and wherein the electrodes are patterned as particularly recited in claim 1;

the combination wherein the portions with displacement gradients relate to the portions of different rigidity vary in the manner disclosed, as it is believed would be recited in claim 4;

the combination wherein the areas of differing displacement ratios are related to the number of holes as disclosed, as it is believed would be recited in claim 5;

a variable-shape mirror wherein it is the flexible film that has a plurality of electrodes subject to electrostatic force, wherein a ratio of the portion with low rigidity varies in a circumferential direction, as recited in claim 6;

a variable-shape mirror wherein it is the flexible film that has a plurality of electrodes subject to electrostatic force, wherein a number of holes per unit area varies in the circumferential direction, as it is believed to be intended by claim 7; or

a variable-shape mirror wherein the flexible film has a plurality of electrodes and a peripheral portion of lower rigidity, particularly wherein the fixed lower electrodes are patterned in the manner disclosed, as it is believed would be recited in claim 9.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Little, et al (U.S. Patent number 6,665,109) disclose an electrostatically movable mirror (2345) surrounded by a flexible region (2315), the mirror having a plurality of upper electrodes on one side thereof and across from a single fixed lower electrode adjacent plural electrode leads (Figs. 13A & 13B).

Waters, et al (U.S. Patent number 6,581,465) disclose a membrane mirror having a plurality of openings in membrane to increase flexibility (Fig. 4).

Graves, et al (U.S. Patent number 6,568,647) discloses a variable-shape mirror comprising a piezoelectric laminate having a pattern of lower electrodes, and two upper electrodes, the plate expressly being disclosed as rigid as opposed to flexible.

Flanders, et al (U.S. Patent number 6,525,880) disclose a fixed-shape mirror comprising a flexible film with a reflective surface and a single electrode, and teach adjusting the stiffness of the membrane using a variety of tether patterns at a peripheral region of the mirror.

Graves, et al (U.S. Patent 6,464,364) disclose electrode patterns for a piezoelectrically deformable mirror.

Goossen (U.S. Patent number 6,424,450) discloses an electrostatically actuated membrane and discloses that holes in the membrane serve to dampen vibration.

Perkins, et al (U.S. Patent number 4,093,351) disclose a variable-shape mirror (Fig. 3) comprising flexible film (76) having a plurality of electrodes (but no reflective

surface) and teach that the electrode shapes and configuration must be selected in accordance with the desired nominal surface figure of the membrane to be deformed.

G. Vdovin, et al (*Opt. Eng.*) disclose a variable-shaped mirror having lower electrodes arranged at different intervals for electrostatic deflection (Fig. 4).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Juba whose telephone number is (571) 272-2314. The examiner can normally be reached on Mon.-Fri. 9 - 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Drew Dunn whose number is (571) 272-2312 and who can be reached on Mon.- Thu., 9 – 5.

The centralized fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306 for *all* communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2800.

JOHN JUBA, JR.
PRIMARY EXAMINER
Art Unit 2872

March 18, 2005